

A NEW SPECIES OF *PARALUCIA* WATERHOUSE AND TURNER FROM NEW SOUTH WALES (LEPIDOPTERA: LYCAENIDAE)

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Abstract

Paralucia spinifera sp. n. is described, figured and compared with other species of *Paralucia*. The early stages are also described.

Introduction

A single female of an undescribed species of *Paralucia* Waterhouse and Turner was taken on 28 October 1964 near Bathurst, N.S.W. by I. F. B. Common and M. S. Upton, and was mentioned by Common and Waterhouse (1972). Despite many searches the species was not rediscovered until 25 October 1977, when three males and two females, as well as eggs, were taken very near the spot where the earlier specimen originated. A larva which hatched from one of the eggs was reared to the pupal stage in the laboratory. Although this species is less conspicuous than the other two species of *Paralucia*, it is remarkable that it should have remained undiscovered for so long.

Paralucia spinifera sp. n. (Figs 1-6, 8-10, 13)

Types:— *Holotype* ♂ labelled "33.27S 149.48E, 20 km E of Bathurst, N.S.W., 1000 m, 25.Oct.1977, E. D. Edwards", Reg. No. 3292, in Australian National Insect Collection. **Paratypes**, 2♂ 3♀; 2♂ 2♀ with same label data as holotype (1♂ 1♀ genitalia tube No. 196 and 199 respectively, 1♀ genitalia slide M502); 1♀ labelled "10 mls E of Bathurst, N.S.W., 2800 ft, 28.Oct.1964, I. F. B. Common and M. S. Upton"; all in Australian National Insect Collection. A preserved egg and larva, as well as a living pupa, are excluded from the paratype series.

Distribution:— The species is known only from a small area 16 to 20 km E of Bathurst, New South Wales, at an altitude of about 1000 m.

Description:— *Male* (Figs 1, 3). Head black with some white scales; frons black with narrow central and marginal white bars; antennae shining black, ringed with white; club black above, beneath shining white towards base and black towards tip with posterior surface unscaled; labial palpi black above, beneath second segment white with occasional grey scales, terminal segment grey. Thorax black above with pale grey hair-scales, pale grey beneath. Legs grey-brown above, white beneath; fore tibia with long terminal spine; mid tibia shorter than first tarsal segment. Abdomen black above, pale grey beneath; tip with some pale grey scales. Fore wing: costa strongly arched near base, then straight; termen evenly rounded; above shining purple with broad black costal and terminal margins, black bar at end of cell; veins narrowly black; a row of very small subterminal pale blue spots midway between veins from R_5 to CuA_1 ; cilia black, white-tipped between veins; beneath grey-brown; base speckled with white scales; bands dark brown margined with white; small subbasal band in cell; submedian band from R_2 to $1A + 2A$, sections between R_2 and R_3 and between CuA_1 and CuA_2 displaced distally; median band at end of cell from R_3 to M_3 ; postmedian band from R_3 to $1A + 2A$, speckled with white scales, section between M_1 and M_3 displaced distally; subterminal area with speckling of white and brown scales forming a poorly defined crenulate line; termen brown; cilia grey-brown, white-tipped between veins. Hind wing: termen rounded; tornus somewhat produced; above shining purple with broad black costal, terminal and inner margins; veins narrowly black; a row of small subterminal pale blue spots between veins from M_1 to inner margin; base with long silvery hair-scales; cilia black, white-tipped between veins; beneath grey-brown, with scattered

pale bronze scales in disc and towards tornus and scattered white scales towards costa, termen and inner margin; bands dark brown margined with white, subbasal band from Sc + R₁ to 1A + 2A poorly defined, submedian band with sections widely spaced from Sc + R₁ to 1A + 2A, sections between CuA₁ and 1A + 2A displaced distally, median band at end of cell extending from M₁ to M₃, postmedian band from costa to inner margin, sections between M₃ and CuA₂ broader than remainder, sections displaced distally between CuA₁ and CuA₂ and proximally from Sc + R₁ to M₁ and from 1A + 2A to inner margin, scattered brown and white scales forming an indistinct subterminal line; termen grey-brown; cilia grey-brown, white-tipped between veins. Fore wing length 10-11 mm.

Male genitalia (Fig. 9). Tegumen and uncus strongly arched above vinculum; uncus produced into a pair of pointed processes, posterior margin rounded; valva narrow, strongly curved, tip slightly hooked; juxta Y-shaped, lightly sclerotized; aedeagus curved, broad at base, much narrower distally, distal orifice oblique.

Female (Figs 2, 4). Head, thorax and abdomen as in male except that shining white scales at base of antennal club are absent in some specimens, tip of abdomen without pale grey scales. Fore wing: termen evenly rounded; above dark brown, discal area dark brown sometimes with shining bronze scales; veins dark brown; base with a few scattered blue scales; a row of very small subterminal pale blue spots sometimes present between veins from M₂ to 1A + 2A; cilia dark brown white-tipped between veins; beneath pale brown; markings brown, edged with white; markings as in male. Hind wing: termen slightly produced at the veins; above dark brown, paler in disc; scattered blue scales at base; a row of subterminal pale blue spots between veins from M₁ to 1A + 2A; inner margin brown; base with long grey hair-scales; cilia dark brown, white-tipped between veins; beneath pale brown, sometimes with scattered bronze or mauve scales; markings brown similar to male. Length of fore wing 11-12 mm.

Female genitalia (Fig. 10). Corpus bursae simple; basal part of ductus bursae sclerotized on ventral surface and bent to a right angle ventrally; a narrow band of sclerotization on posterior margin of dorsal wall of sinus vaginalis; another narrow band of sclerotization on the lateral walls of the sinus vaginalis meeting ventral to the ostium.

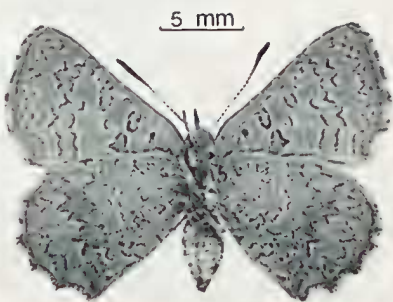
Life history:— *Egg*. Hemispherical, pale green at first, later pale cream; micropyle deeply depressed, with dense fine pits separated by ridges produced to short points where ridges intersect. Diameter 0.8 mm, height 0.4 mm. One egg preserved in the Australian National Insect Collection, tube No. 2935.

First instar larva. Cream with brown dorsal, subdorsal and lateral lines; prothoracic and anal plates shining black. Head hidden; thorax and abdomen with primary setae black, some long and tapering, others short and bluntly tipped. Length 2.5 mm.

Fifth (final) instar larva (Fig. 5). Head dark brown; prothoracic segment grey with lateral white and reddish brown lines; prothoracic plate mottled dull brown-black; thoracic segments with lateral setae colourless, dorsal and lateral surfaces densely covered with short secondary setae pale in colour but dark above dorsal and subdorsal lines; mesothoracic, metathoracic and abdominal segments grey with brown dorsal and subdorsal lines, subdorsal line angled laterally towards rear of each segment, lateral line greyish brown with reddish brown line between lateral and subdorsal lines, grey beneath; spiracles brown; abdominal segments 4 to 7 with dorsal setae prominent, short and black; dorsal and lateral surfaces densely covered with short secondary setae pale in colour but dark brown above dorsal and subdorsal line; abdominal segment 8 with prominent dorsolateral projections bearing eversible organs which are usually everted; anal segment grey; anal plate mottled dull brown-black. Length 14 mm. One final instar larva preserved in the Australian National Insect Collection tube No. 2936.

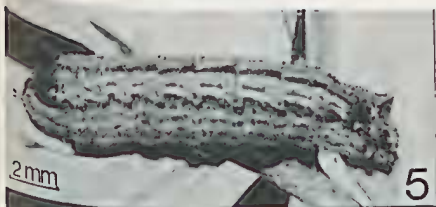


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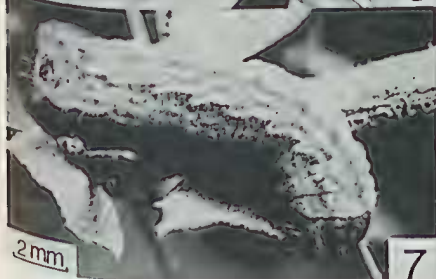


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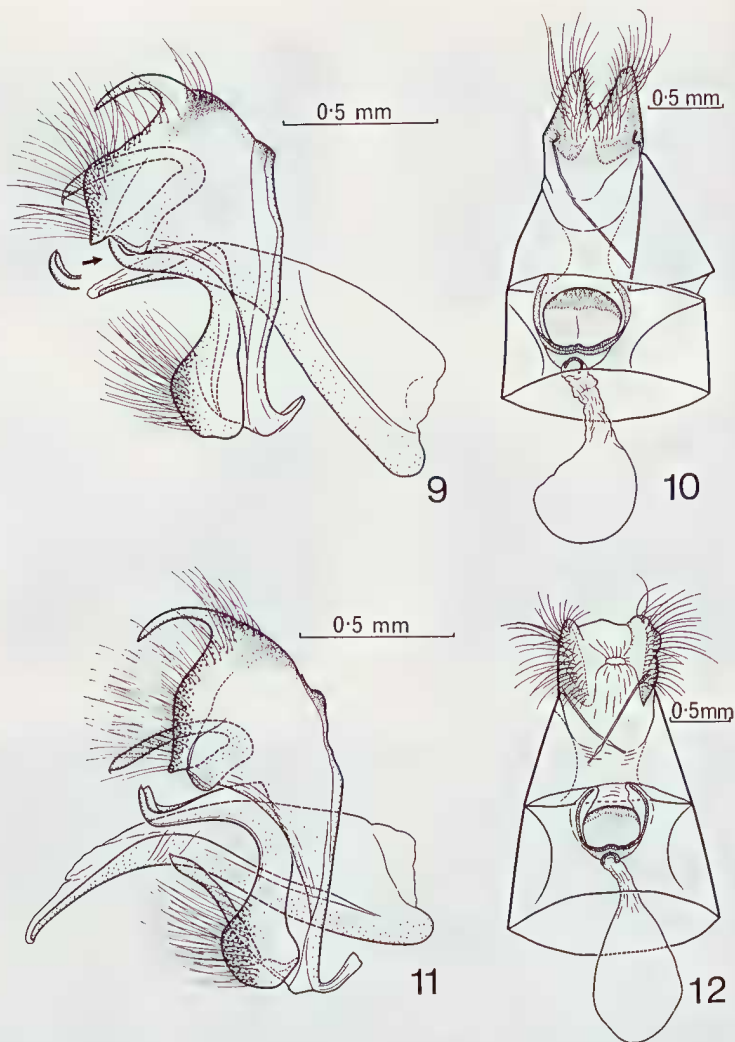


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Figs 1-8. (1) upperside holotype ♂ *P. spinifera* sp. n.; (2, 4) upper and underside paratype ♀ *P. spinifera* sp. n.; (3) underside paratype ♂ *P. spinifera* sp. n.; (5) final instar larva *P. spinifera* sp. n.; (6, 8) lateral and dorsal view of pupa *P. spinifera* sp. n.; (7) final instar larva *P. aurifera*.



Figs 9-12. (9, 11) lateral view of male genitalia; (9) *P. spinifera* sp.n.; (11) *P. aurifera*; (10, 12) ventral view of female genitalia; (10) *P. spinifera* sp.n.; (12) *P. aurifera*.

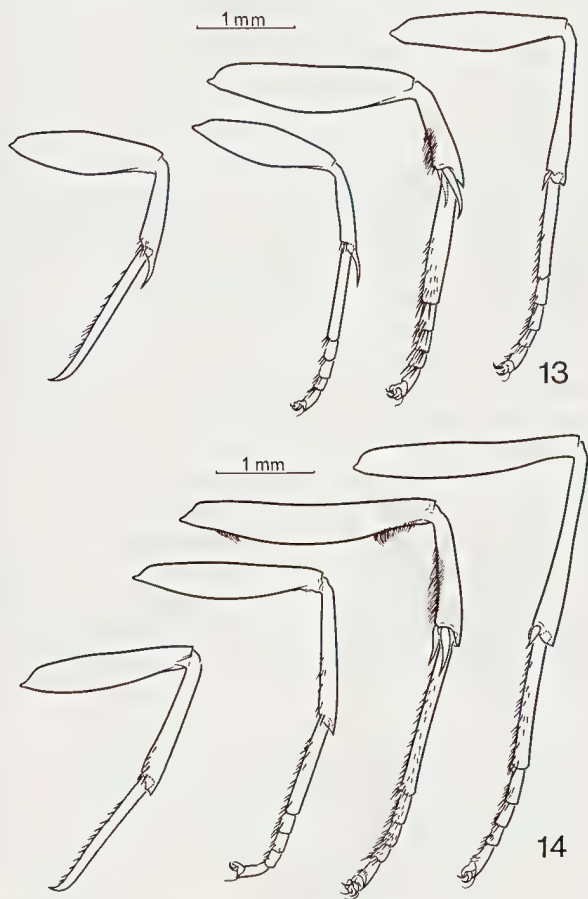
Pupa (Figs 6, 8). Head and thorax brown; abdomen pale greenish brown with grey dorsal line on abdominal segments 4 to 6; with thinly scattered brown dots particularly on wings; distinctly blackened antennae; spiracles pale brown; surface of cuticle roughened, particularly on head and covered with minute raised dots; a few anal hooks present but without central girdle. Length 10 mm, width 4 mm.

Foodplant:— *Bursaria spinosa* Cav. (Pittosporaceae).

Discussion

The number of pale blue spots varies in the fore wings of both sexes of *Paralucia spinifera* and they may be absent in the fore wing of the female. The available specimens are too worn to determine variation of the pattern beneath. The markings on the undersides of the hind wings are sometimes dark brown instead of brown.

Paralucia spinifera differs from *P. aurifera* (Blanchard) and *P. pyrodiscus* (Rosenstock) in having the tip of each fore tibia, in both sexes, produced as a conspicuous, non-articulated, spine-like process that extends over the base of the tarsus (Figs 13, 14). The tip of the mid tibia is also slightly produced and has the normal pair of articulated apical spurs. In both *P. spinifera* and *P. aurifera* the tibia of the mid leg is shorter than the first tarsal segment but in *P. pyrodiscus* the mid tibia is slightly longer than the first tarsal segment.



Figs 13, 14. Male fore leg and female fore, mid and hind legs: (13) *P. spinifera* sp. n.; (14) *P. aurifera*. All are left legs viewed from the outside.

In the male of *P. spinifera* the apex of the fore wing is less acute, the termen more rounded and the tornus of the hind wing less produced than in the other species. The copper areas above in the other species are replaced in *P. spinifera* by shining purple in the male and dark brown in the female. The markings beneath are similar but larger and darker in *P. spinifera*.

As in other *Paralucia* the male genitalia of *P. spinifera* have the upswept tegumen, which raises the processes of the uncus above the peak of the vinculum. They differ from *P. aurifera* (Fig. 11) and *P. pyrodiscus*, which have closely similar genitalia, by the more rounded posterior margin of the uncus in lateral view and the lightly sclerotized juxta. The female genitalia of *P. spinifera* and *P. aurifera* are also similar.

The larva and pupa of *P. spinifera* resemble those of *P. aurifera* (larva, Fig. 7) and could not be distinguished on their colour, shape or on the form of the secondary setae. The larva of *P. pyrodiscus* is paler in colour and the markings are less conspicuous. The larvae of all three feed on *Bursaria spinosa*. The pupa of *P. pyrodiscus* is yellowish brown.

Adult males flew rapidly at about 1 m from the ground and rested with wings half open on dead twigs of the foodplant. While resting they could easily be mistaken for large specimens of *Neolucia agricola* (Westwood). Females flew close to the ground near the foodplant and less rapidly than the males. Neither *P. aurifera* nor *P. pyrodiscus* has been taken flying with *P. spinifera*.

Eggs were laid singly on the upper surfaces of fully expanded leaves or on stems of young shoots of the foodplant. Small black ants of the genus *Iridomyrmex*, which were present on the foodplant attending aphids, possibly attend the larvae of *P. spinifera*. Probably the larvae behave in a similar way to other species of *Paralucia*, feeding at night and resting in cracks in the soil at the base of the foodplant during the day and pupating in similar positions. In the laboratory the only larva that pupated spun a silken pad prior to pupation but spun no central girdle. The duration of the larval stage was about 48 days in the laboratory at about 22°C but the pupal duration is not yet known. Observations suggest that there is a single generation each year.

Specimens were collected in a partially cleared sclerophyll forest dominated by regrowth *Eucalyptus bridgesiana* R. T. Baker about 8 m high with an understorey of *Bursaria spinosa*, *Styphelia* sp. and *Cassinia* sp. *P. spinifera* could be found on few *Bursaria* bushes and the population appeared to be very small in the half hectare of forest remaining. Further damage to the vegetation or over collecting at the type locality must place this colony, the only one so far known, in jeopardy.

Acknowledgements

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Reference

- Common, I. F. B. and Waterhouse, D. F., 1972. *Butterflies of Australia*. Angus and Robertson, Sydney. 498 pp.